

**VOTE-PAD/DESI AccuVote-OS
VOTE-PAD/HART BALLOT NOW**

**Vote-PAD
Voting-on-Paper Assistive Device and
System
Used In Conjunction With**

**Diebold Election Systems, Inc.
GEMS / AccuVote-OS**

and

**Hart InterCivic
BOSS / Ballot Now / Tally**

Staff Review and Analysis

**Prepared by:
Secretary of State Office of
Voting Systems Technology Assessment**

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I. SUMMARY OF THE APPLICATION

The Secretary of State has simultaneously tested and evaluated two applications for approval of voting systems that incorporate the Vote-PAD Voting-On-Paper Assistive Device (VPAD):

A joint application from Vote-PAD, Inc. and Trinity County proposing use of the Vote-PAD system with the Diebold Election Systems, Inc. (DESI) voting system comprised of GEMS software, version 1.18.24, AccuVote-OS (Model D with firmware version 1.96.6), AccuVote-OS Central Count with firmware version 2.0.12, and Accu-Feed, together with procedures for use of the joint system; and

A joint application from Vote-PAD, Inc. and Yolo County proposing use of the Vote-PAD system with the HART Intercivic, Inc. voting system comprised of Ballot Origination Software System (BOSS) version 4.2.13, Ballot Now version 3.2.4, Rally software version 2.2.4, Tally System version 4.2.8, SERVO software version 4.1.6, and eCM Manager version 1.1.7, together with procedures for use of the joint system.

In each case, the Vote-PAD System is comprised of the Vote-PAD booklets and preparation tools, Verification Wand model VW-1.1, Vote-PAD User's Guide, Vote-PAD Instruction Assistant version 1.1, and supporting documentation.

Additionally, the Vote-PAD/Trinity County application proposes use of the Sony Model TCM-929, Modified For the Blind by Innovative Rehabilitation Technology, Inc. for voter audiotape playback when voting with the Vote-PAD. The Vote-PAD/Yolo County application proposes use of the Telex Narrator for voter audiotape playback when voting with the Vote-PAD.

II. SUMMARY OF THE SYSTEMS

In each proposed system, the non-Vote-PAD elements of each system have previously been approved as a complete system by the Secretary of State. The DESI system is an optical-scan ballot system composed of the GEMS election management software, a precinct-based mark-sense ballot scanner and a central count mark-sense ballot scanner for absentee ballot tabulation. The HART system is comprised of election management software to define elections, generate and print paper ballots, as well as to capture images of voted ballots and generate vote results from those images. More detail on these systems can be found in the staff reports for testing those systems. (These reports are currently available on the Secretary of State's website at: http://www.ss.ca.gov/elections/elections_vs2.htm.)

The proposed Vote-PAD System is entirely new to California and is comprised of the following elements:

1. Vote-PAD Booklet, version 1

The Vote-PAD booklet is a spiral bound booklet that contains clear plastic sleeves designed to hold paper ballots for the respective system with which it is used. The sleeves are prepared by punching holes for each valid voting target on the ballot style with which that particular booklet will be used. A separate booklet must be prepared for each ballot style used in a polling place. Touch navigation of the booklet is accomplished by Bumpons – small round and triangular rubber pads – affixed to the

sleeves to indicate valid voting positions. Small metal clamps are attached to the cover and each ballot sleeve inside to assist in turning booklet pages. Finally, the cover of the Vote-PAD booklet serves as a privacy shield to protect the confidentiality of a voted ballot until the voter deposits it in the ballot box.

2. Vote-PAD Booklet Preparation Tool Kit

The Vote-PAD system includes a special tool kit that is used to prepare each Vote-PAD booklet for the associated ballot style with which it will be used. The tool kit includes punches matching the size and shape of the voting positions on the associated system ballot, a plastic anvil, and a larger punch for write-in positions, a small (1/8") punch to produce alignment holes to ensure ballots are correctly inserted into the sleeve, an assortment of oval and triangular adhesive Bumpons and metal page-turning clamps.

3. Special Write-In Sheets

The Vote-PAD systems provide a voter with a special write-in sheet to record their write-in candidate's name. The sheet contains a raised grid of twenty-eight rows and thirty columns. To the left of the first two rows are the raised numbers "1" and "2", together with the Braille equivalent of those numbers. The remaining rows are labeled "A" through "Z", again with the raised uppercase letter and its Braille equivalent. Voters record each write-in vote on a separate write-in sheet by marking the contest in the first two rows, and then making marks in the appropriate spaces on the grid below to spell out the write-in candidate's name.

4. Verification Wand, Model VW-1.1

The verification wand is a battery-powered, hand-held device that is light sensitive and vibrates when held vertically against a dark surface and activated. The wand is designed so that a voter can use the device to verify votes by listening to the audio script and activating the device over each voting target to determine if the appropriate targets have been marked.

5. Polling Place Supplies

Each polling place must be provided with additional supplies to assist voters in using the Vote-PAD booklet. These supplies include:

- Audio cassette, large-print and Braille instructions for using the Vote-PAD system to vote and verify a ballot;
- Separate audio cassette, large-print and Braille ballot navigation instructions for each ballot style and its associated Vote-PAD booklet;
- Commercial off-the-shelf (COTS) audio cassette player and headphones for listening to audio cassette instructions for use of the Vote-PAD system and ballot navigation instructions; and
- Non-skid mats that can be placed on the voting surface to prevent the Vote-PAD from sliding during use.

In lieu of specifications for the COTS audio cassette players to be used with the Vote-PAD/DESI system, the applicants have identified the Sony Model TCM-929, Modified for the Blind by

Innovative Rehabilitation Technology, Inc. as the cassette playback device for the system. In addition to the normal cassette audio controls, the device features a dial for adjusting the actual playback speed.

In lieu of specifications for the COTS audio cassette players to be used with the Vote-PAD/Hart system, the applicants have identified the Telex “Narrator” as the cassette playback device for the system. In addition to the normal cassette audio controls, the device features the capability to adjust audio speed.

6. Vote-PAD Instruction Assistant, version 1.1

The Instruction Assistant is a Microsoft Excel spreadsheet application with macros written in Microsoft Visual Basic for Applications. The jurisdiction inputs the ballot layout information (contests, candidates and ballot measures and their positions) into the Instruction Assistant application, which then generates a script for preparation of the audiocassette, large-print and Braille ballot navigation instructions.

III. TESTING INFORMATION AND RESULTS

1. Federal Testing

The Vote-PAD System and its components have not been submitted for any examination and testing by any of the approved Independent Testing Authorities (ITAs) for compliance with any of the 2002 Federal Voting System Standards (VSS).

To date, the vendor, Vote-PAD, Inc., has maintained that the VSS standards do not apply to their system because the Vote-PAD system is not computer based. (<http://www.vote-pad.us/FederalCertification.asp>) In fact, Section 1.6 of the 2002 Voting System Standards, states:

1.6 Application of the Standards and Test Specifications

The Standards apply to all system hardware, software, telecommunications, and documentation intended for use to:

- Prepare the voting system for use in an election;
- Produce the appropriate ballot formats;
- Test that the voting system and ballot materials have been properly prepared and are ready for use;
- Record and count votes;
- Consolidate and report results;
- Display results on-site or remotely; and
- Maintain and produce all audit trail information.

The federal Voting System Standards were designed to address voting systems and their components, whether mechanical or electronic. Within those standards and within HAVA, "voting systems" are broadly defined to include not only the ballot marking and verification devices, but also all the procedures and documentation surrounding voting systems and their components. Aspects of those standards that could possibly apply to the Vote-PAD system include, but are not limited to:

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- Functional capability: election preparation, voting capabilities, maintenance and storage requirements (including accuracy and reliability);
- Compliance with accessibility standards;
- Hardware standards;
- Software standards;
- Security standards;
- Quality assurance practices;
- Vendor practices for quality assurance, configuration management and change control;
- Accuracy and reliability under normal and abnormal conditions; and
- System documentation requirements.

On May 1, 2006, the Secretary of State's Office sent a letter to Vote-PAD that included:

If you have already received a written determination from NASED that the Vote-PAD system does not fall under the federal 2002 Voting System Standards, please forward a copy of such advice. Otherwise, we strongly urge you to contact NASED for this determination and to consider voluntary examination by a federal ITA to the degree the federal standards apply to your system.

Finally, the documentation of the system provided by the vendor includes specifications for the verification wand. Those specifications provide electrical requirements and environmental specifications for the device. (e.g. physical shock, operating temperature, humidity, etc.) Further, the device contains a vibrating motor and a light-emitting diode (LED). No documentation of independent laboratory testing has been provided to indicate that the system meets or exceeds the claimed specifications, that there is no risk of shock from the device, that there is no risk to the human eye from emissions of the LED, and/or that there is no risk of improper electro-magnetic radiation from the device that could interfere with other external devices (such as a human pacemaker.)

2. State Testing by the Secretary of State and Consultant

Testing Overview

State examination and functional testing of both systems was conducted by Secretary of State staff in conjunction with the State's technical consultants, Mr. Paul Craft and Ms. Kate McGregor, at the Secretary of State's Office in Sacramento, California on July 19 and 20, 2006.

For the test of each system, the applicants were required to select their largest ballot style from a recent election and then to prepare five complete set-ups of Vote-PAD booklets and accompanying instruction sets in Braille, large-font and audio cassette based on that ballot and in accordance with the proposed use procedures for that system. Further, applicants provided staff to serve as "poll workers" for the test, properly equipping and instructing the test participants in accordance with the proposed use procedures.

An open call for test volunteers was made to local disabled advocacy organizations such as Independent Living Centers, FREED Center for Independent Living, the California Council of the Blind, and Protection and Advocacy, Inc., as well as the California Department of Rehabilitation. A total of thirty-one volunteers participated in the testing.

Upon arrival, test participants were randomly assigned to one of the proposed systems. After listening to a brief explanation of the purpose and rules of the test and agreeing to the terms of the test and a

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confidentiality statement, each participant was instructed on use of the Vote-PAD system by the applicant staff serving as poll workers and was then allowed to practice voting using the system. Neither time limits, nor other restrictions were placed on this training and testing. Poll workers were given free reign and allowed as much time as they and the voter felt was necessary to be sure the voter was comfortable using the system.

The primary purpose of the test was to confirm that the Vote-PAD could accurately record a voter's vote choices and provide a means to verify those choices for voters with a range of disabilities.

The test was conducted in two phases. During the first phase, test voters voted a complete ballot while their vote choices were carefully observed and recorded by monitors. The Secretary of State's staff and consultants served as the test monitors to observe and record test performance. These monitors followed a predetermined script that generally allowed the voter to freely vote his or her choices for most contests. At set points, the script called for the voter to (a) skip one or more contests, (b) back-up and vote for a specific candidate, or (c) vote for a specific write-in candidate. If the voter had a question on using the Vote-PAD during voting, a poll worker was summoned and allowed to provide additional instruction on the Vote-PAD. The poll worker was not allowed to provide the voter any assistance on actually voting or verifying the ballot so as to ensure the voter voted privately and independently. Once the ballot was completed, the voter was required to actually deposit the ballot in the ballot box in accordance with the proposed procedures for the system. Each voter was then read a brief exit survey and the monitor assigned to that voter recorded the responses.

Participants who were blind participants and participants with severe visual impairments were invited to participate in the second phase of the test. In that phase, the test participants were provided with a pre-marked ballot and accompanying write-in sheets for that ballot, and the participants were asked to determine how that ballot had actually been voted using the Verification Wand. The pre-marked ballots for this phase included under-voted contests, over-voted contests, and multiple write-in candidate votes. Again, the verifications and responses were observed and recorded by the Secretary of State's test monitors for later verification against the actual ballots.

At the conclusion of the test, the voted ballots were tallied in accordance with the system procedures and the results were compared against the intended vote choices expressed by the voters.

The appendix to this report includes the protocol established for this test, the monitor script for testing each system, and the exit survey that was given to each participant.

General Testing Results

Seventeen volunteers participated in the Vote-PAD/DESI System test, while fourteen participated in the Vote-PAD/Hart System test. **For each system, the overall system error rate (as measured by the number of contests incorrectly voted compared to the total of contests voted) was 10% or greater. As indicated in Table 1 below, this worked out to an average of 2.6 errors per ballot on the Vote-PAD/DESI system and 3.0 errors per ballot on the Vote-PAD/Hart system.** For purposes of this statistic, a contest was considered voted incorrectly if the ballot was not marked and tabulated as the voter stated he or she was voting for that contest while casting his ballot.

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	Vote-PAD /DESI	Vote-PAD /Hart	Combined
<i>All Voters</i>			
Ballots Cast	17	14	31
Contests Voted	441	392	833
Contests Correct	397	350	747
Error Rate	10.0%	10.7%	10.3%
Avg Invalid Votes/Ballot	2.6	3.0	2.8

Table 1 - Average Error Rate by System

For further analysis, volunteer participants were assigned to one of the following categories:

- **Mobility-Impaired** – These voters had full use of their hands to mark a ballot and full use of their eyes to navigate and verify a ballot. Generally, these voters would be expected to mark a ballot without the assistance of the Vote-PAD booklet.
- **Dexterity-Impaired** – These voters had full use of their eyes to navigate and verify a ballot, but had manual dexterity impairments that made it difficult to grasp a pen and mark a ballot in the traditional manner. For these voters, the metal clamps assisted in turning the pages of the Vote-PAD booklet, and the booklet’s plastic sleeves protected the ballot from many – but not all – stray marks.
- **Vision-Impaired (partial vision)** – These voters had some use of their vision for ballot navigation and verification, but would be expected to benefit from the Vote-PAD system for ballot navigation and protection from stray marks.
- **Vision-Impaired (blind)** – These voters had no vision and were entirely dependent upon the Vote-PAD navigation tools (audio, large-font or Braille direction), as well as tactile sensation to vote a ballot with the Vote-PAD system.
- **Developmentally Impaired** – Three test participants identified themselves developmentally disabled. One of these three participants was also fully blind.

Table 2 details the Average Error Rate broken down by disability category.

It should be noted that all four voters in the mobility-impaired category cast perfect ballots. All their vote choices were captured and counted as intended.

The twelve voters with manual dexterity impairments averaged slightly higher in ballot errors. The combined error rate of both systems was 4.7% for these voters, or 1.3 invalid contests per ballot.

Test participants with partial or low vision had a combined error rate for both systems of 12.3%. Of the two systems, voters on the Vote-PAD/DESI system performed slightly better with an average of 5.2 incorrectly voted contests per ballot, while their counterparts on the Vote-PAD/Hart system averaged 6.0 incorrectly voted contests per ballot.

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	Vote-PAD /DESI	Vote-PAD /Hart	Combined
<i>Mobility-Impaired Voters</i>			
Voter Count	3	1	4
Contests Voted	87	28	115
Contests Correct	87	28	115
Error Rate	0.0%	0.0%	0.0%
Avg Invalid Votes/Ballot	0.0	0.0	0.0
<i>Dexterity-Impaired Voters</i>			
Voter Count	5	7	12
Contests Voted	145	196	341
Contests Correct	137	188	325
Error Rate	5.5%	4.1%	4.7%
Avg Invalid Votes/Ballot	1.6	1.1	1.3
<i>Vision-Impaired Voters - Partial Vision</i>			
Voter Count	2	2	4
Contests Voted	58	56	114
Contests Correct	52	48	100
Error Rate	10.3%	14.3%	12.3%
Avg Invalid Votes/Ballot	3.0	4.0	3.5
<i>Vision-Impaired Voters - Blind</i>			
Voter Count	5	3	8
Contests Voted	145	84	229
Contests Correct	119	66	185
Error Rate	17.9%	21.4%	19.2%
Avg Invalid Votes/Ballot	5.2	6.0	5.5
<i>Developmentally Impaired Voters</i>			
Voter Count	2	1	3
Contests Voted	6	28	34
Contests Correct	2	20	22
Error Rate	66.7%	28.6%	35.3%
Avg Invalid Votes/Ballot	2.0	8.0	4.0
Table 2 - Ballot Error Rates by Disability Group			

For the eight voters who were blind, the overall error rate jumped to over 19%, again with test participants performing slightly worse on the Vote-PAD/Hart System than on the Vote-PAD/DESI system.

Finally, the three test participants with developmental disabilities performed least accurately on this system. One such voter, who was also blind, seemed completely confused by the directions and appeared to nod off multiple times during the test. This voter only voted one contest and voted it incorrectly. A second such voter was able to vote five contests, and only two of those cast correctly.

The final such voter was able to complete her ballot, but with a 28.6% error rate. The combined error rate for these three voters was 35.3%.

Errors were further categorized by their nature:

- **Navigation errors** – occurred when voters marked a different voting target than voters thought they were voting. This may have resulted in a vote cast for a different candidate in the same contest, or a candidate in an entirely different contest.
- **Stray marks** – occurred when the voter unintentionally made additional marks on the ballot that affected the vote results. These generally took one of two forms: a stray mark into the ballot channel for timing marks that caused the contest to be incorrectly read, or a stray mark in another voting target that created an over-vote for that contest.
- **Marginal marks** – occurred when the mark was not complete enough or was positioned improperly (slightly askew) and could not be counted as a vote by the voting system. In some cases, this appeared to be caused by a ballot that was slightly off alignment in the Vote-PAD booklet, resulting in several adjoining contests in a corner of the ballot to be mis-voted.

There were additional error categories relating to write-in votes:

- **Failure to mark the write-in indicator target** – occurred when the voter forgot or otherwise failed to mark the oval to indicate he or she was casting a write-in vote for that contest. Under California law, such an error invalidates the write-in vote for that contest.
- **Illegible write-in name** – occurred when the written-in candidate name could not be read by the jurisdiction during tabulation. This error occurred when voters wrote out the name in the write-in slot on the ballot. It also occurred when the voter printed the contest and candidate name on the back of the write-in grid sheet and that name could not be read. Finally, this occurred when the voter mis-marked the candidate name using the write-in grid sheet in such a way that the voter's choice could not be determined.
- **Contest identification error** – occurred on the write-in grid sheet when the voter failed to mark the contest number portion of the grid or marked the grid for the wrong contest.

There is not a one-to-one correlation between the occurrence of the various errors and the number of contests voted incorrectly. For instance, a voter who made a navigation error may have invalidated two contests with one error: one contest under-voted and the other contest over-voted. Similarly, a voter may have made multiple errors within the same invalidated contest, such as forgetting to mark the write-in indicator target and writing in an illegible name. After the closing of the polls, the ballots were scanned and vote results were generated. Where questionable markings required review and interpretation, the applicant jurisdiction representatives made the vote-cast determination based on their customary practices.

Table 3, below, details the error types by voting system and voter disabilities.

Again, the group of voters with mobility impairments made no errors.

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Vote-PAD / DESI System						
	Mobility	Dexterity	PartVision	Blind	Devl	
General Errors						
Navigation (wrong target)	0	0	0	7	5	
Stray Markings (Overvotes, etc)	0	0	0	5	1	
Marginal mark from ballot alignment	0	3	1	7	0	
Write-Ins- SLOT	12	11	0	2	0	
Skipped W/I Target	0	1	0	0	0	
Illegible Name	0	4	0	0	0	
Write-Ins- GRID	0	0	3	8	0	
Skipped W/I Target	0	0	0	3	0	
Bad/Missing Contest # on grid	0	0	0	6	0	
Invalid/unreadable name	0	0	1	0	0	
Missing Grid Sheet	0	0	0	0	0	
Write-Ins- Longhand on back of grid sheet	0	4	4	10	0	
Skipped W/I Target	0	0	4	3	0	
Illegible Name	0	0	0	0	0	
TOTAL ERRORS	0	8	6	31	6	
BALLOT COUNT	3	5	2	5	2	
AVERAGE ERRORS/BALLOT	0.0	1.6	3.0	6.2	3.0	

Vote-PAD / Hart System						
	Mobility	Dexterity	PartVision	Blind	Devl	
General Errors						
Navigation (wrong target)	0	0	3	8	2	
Stray Markings (Overvotes, etc)	0	0	0	1	1	
Marginal mark from ballot alignment	0	0	0	0	1	
Write-Ins- SLOT	4	24	3	11	5	
Skipped W/I Target	0	4	0	1	2	
Illegible Name	0	4	3	6	4	
Write-Ins- GRID	0	7	2	4	0	
Skipped W/I Target	0	0	0	3	0	
Bad/Missing Contest # on grid	0	1	2	0	0	
Invalid/unreadable name	0	0	2	0	0	
Missing Grid Sheet	0	1	0	0	0	
Write-Ins- Longhand on back of grid sheet	0	16	7	15	8	
Skipped W/I Target	0	0	0	0	0	
Illegible Name	0	0	0	0	0	
TOTAL ERRORS	0	10	10	19	10	
BALLOT COUNT	1	7	2	3	1	
AVERAGE ERRORS/BALLOT	0.0	1.4	5.0	6.3	10.0	

Table 3 Detail of Error Types by System and Disability

Of the eighteen errors noted from the group of voters with dexterity impairments, eight of those errors were for illegible write-in names. Write-in voting issues are discussed in more detail in a later section of this report. The second greatest frequency of error – five incidents – was caused by voters failing to mark the write-in indicator target on the ballot. None of this group had problems with navigating the ballot or stray markings that interfered with their vote.

The group of voters with vision impairments experienced sixteen total errors, three of which were related to ballot navigation. The most common error of this group was also failing to mark the write-in target – four incidents.

Finally, voters who were blind experienced a total of fifty errors. Fifteen of these were related to ballot navigation, and an additional six were related to stray markings that invalidated the contest. The greatest incident of errors, thirty-four, was related to casting write-in votes. Twenty-two of these were from a failure to mark the write-in indicator target.

The appendix contains a reconciliation between the votes intended and the actual votes counted for each contest. While the applicants expressed some concern that the direction to skip a contest and later return to that contest to vote was unfair, it should be noted that errors were distributed fairly evenly throughout the ballot, including in the initial contests on the ballot before such instructions were issued. Further, on the Vote-PAD/DESI ballot, there was not a single error logged on either the Secretary of State or the Proposition 48 contests – the two contests in which voters were asked to return and cast a vote! Finally, it should be noted that there is nothing within this system that prevents a voter from choosing to back up and vote a previously skipped contest and, therefore, it was valid to test such a situation.

The summary of errors by contest does indicate that contests in which voters were instructed to write in votes tended to experience a higher error rate than for other contests.

Instruction and Voting Time

Monitors were instructed to separately track the time involved in training and then the time taken to vote the ballot. In one instance, training time was not captured and in three instances, voting time was not captured by the monitor. Table 4, below, details the average instruction time by disability group. Table 5, below, details the average voting time by disability group.

Applicant poll workers were allowed as much time as necessary to instruct the voter on use of the system, including any assistance devices such as the audio player. Generally, instruction included providing the voter an opportunity to practice voting on a sample ballot. Overall, instruction averaged 15.5 minutes per voter for all voters that participated in the test. Instruction time varied greatly from voter to voter. At one extreme, only two minutes of instruction was provided to one voter who then voted a ballot without error. At the other extreme, one voter who was blind was provided seventy-two minutes of instruction, yet still had a 10% error rate on the ballot cast. In general, voters with visual impairments and voters who were blind took significantly longer for instruction on the Vote-PAD than did other voters.

Voting time also varied tremendously by voter. In general, the sighted voters in the mobility-impaired and dexterity-impaired groups were able to navigate and cast their ballots relatively quickly. All but one completed their ballot on the Vote-PAD/Hart system in eleven minutes or less. On the Vote-

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PAD/Diebold system, these same groups of voters took from six to thirty-three minutes to vote their ballots.

INSTRUCTION TIME							
		Mobility	Dexterity	Partial Vision	Blind	Devl	All Voters
Vote-PAD/DESI	Count	3	5	2	5	2	17
	Total Time	48	39	42	141	30	300
	Avg Time	16.0	7.8	21.0	28.2	15.0	17.6
Vote-PAD/Hart	Count	1	6	2	3	1	13
	Total Time	2	67	48	45	5	167
	Avg Time	2.0	11.2	24.0	15.0	5.0	12.8

Table 4 - Voting Time

Voters who were blind took significantly longer to vote their ballot using the Vote-PAD system. With the Vote-PAD/Hart system, the fastest a voter who was blind voted their ballot was thirty-nine minutes, while the longest a voter who was blind took was forty-four minutes. On the Vote-PAD/Diebold system the voting time varied from forty-seven to 111 minutes for voters who were blind.

Lengthy voting times can have a negative effect, discouraging voters from participating in voting, or at

VOTING TIME							
		Mobility	Dexterity	Partl Vision	Blind	Devl	All Voters
Vote-PAD/DESI	Count	3	5	2	4	2	16
	Total Time	33	101	160	308	73	675
	Avg Time	11.0	20.2	80.0	77.0	36.5	42.2
Vote-PAD/Hart	Count	1	5	2	3	1	12
	Total Time	9	115	66	122	30	342
	Avg Time	9.0	23.0	33.0	40.7	30.0	28.5

Table 4 - Voting Time

least encouraging them to forego the opportunity of voting privately and independently in favor of an assisted process that may be significantly faster.

During testing on the first day, many of the voters with visual impairment chose to use the verification wand while they were voting, after each contest, to verify they had marked the ballot correctly. On the second day, the Vote-PAD vendor expressed concern that voters were not waiting until the end of voting to verify their ballot against the verification section of the audio track, large font booklet or Braille booklet. It was pointed out that all voter instruction on using the system had been done by the applicant poll worker staff. During the second day, those staff members modified their instructions to emphasize waiting until the end of the ballot to use the verification directions to perform their verification. Unfortunately, after taking such a long time to vote their ballots, most of the voters chose to decline that verification step after voting, openly expressing their concern over the time involved. Further, at least two test participants with visual impairments declined to take part in the second phase of the test, citing the extreme amount of time they had already spent voting their ballot.

It should be noted that on the Vote-PAD system there is no easy mechanism to correct an error on a ballot. If a voter takes ten to fifteen minutes for instruction on the system, and then forty-five minutes or longer to mark that ballot, and then discovers an error in marking the ballot, the voter has only two alternatives: to spoil the ballot and start over, or to cast the ballot with the error as made.

Write-in Voting

Fifty-five of the one-hundred ballot errors that occurred were related to write-in voting. Of these fifty-five errors, twenty-one (38%) were attributed to the voter not marking the write-in indicator target on the ballot. While this is not uncommon with all paper ballots, comparison rates for other voting systems are not available. However, there is a concern that voters using the system could face an increased risk of this type of error, due to the increased amount of instruction that must be absorbed and remembered to properly use this voting system.

There are two vendor prescribed methods for casting a write-in vote using the Vote-PAD systems. The first method is to actually write the candidate's name in the ballot space for that write-in. To assist in that, the Vote-PAD booklet has slots cut out over those write-in spaces on the ballot.

Alternatively, the Vote-PAD system provides a voter with a special write-in sheet to record their write-in candidate's name. The sheet contains a raised grid of twenty-eight rows and thirty columns. To the left of the first two rows are the raised numbers "1" and "2", together with the Braille equivalent of those numbers. The remaining rows are labeled "A" through "Z", again with the raised uppercase letter and its Braille equivalent.

A voter using this method for casting a write-in vote first indicates the contest for which the vote is being cast by determining the contest number and then counting over that many columns in row #1 and making a mark in that box. For instance, if a voter wants to cast a write-in vote for Attorney General and that is the sixth contest on the ballot, the voter would make a mark in the sixth column of row number one. If there are more than thirty contests on the ballot, the voter would start on row number two, first column for the thirty-first contest. Next, the voter spells out the write-in name by finding the row representing the first letter in the name and making a mark in the first column for that letter. For the second letter in the name, the voter finds the appropriate row for that letter and makes a mark on that row in the second column. The voter continues spelling out the name by making a mark in each successive column and on the appropriate row for that letter. A separate write-in sheet must be used for each write-in candidate.

Many sighted voters complained that the write-in slot in the Vote-PAD booklet did not leave enough room to write out a candidate's name.

Many of the voters with visual impairments found the separate write-in sheets confusing. In several instances, the "poll worker" had to be recalled to provide additional instruction when it was time to cast the first write-in vote. Only six of the twelve voters with visual impairments or who were blind attempted to use the write-in grid as described. One of these abandoned the grid after casting the first write-in vote and chose instead to write out the name in the space on the ballot for the four remaining write-ins. For that voter, three of the four write-ins were invalidated because the name was illegible.

Voters appeared to find the use of the write-in sheets confusing. One voter in particular noted that the contest identification scheme (linear contest numbering, from the beginning through the end of the

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ballot) was confusing because it differed from the ballot navigation instructions which were based on column number and then contest number within the column. (e.g., “second column, third contest”) At the start of the second day of testing, the Vote-PAD representative noted that the system was designed for the voter to first fully mark the ballot, filling in the write-in indicator target for those contests in which the voter intended to write-in a candidate’s name. Once the ballot is completed, audio instruction (and presumably Braille and large-font instruction) guides the voter back through the write-in process, identifying each contest and its contest number in turn. It was pointed out to the vendor that the applicant poll workers were providing the instruction and training for the test participants, and they were allowed to provide whatever instruction they felt was appropriate and necessary. Some of those who used the grid on the second day continued to have problems completing the grid correctly, mismarking the contest number, forgetting to mark the contest number or incorrectly marking the write-in name in the grid.

Voters with visual impairments who did not want to use the grid often chose to write the name by hand directly on the ballot, although there is no method for a voter who is blind to verify if the name was written correctly. In fact, of the sixteen write-in votes cast by visually impaired voters in this manner, nine were deemed invalid due to illegibility by the applicant election officials operating under normal rules for ballot resolution.

Alternatively, some voters with visual impairments who did not want to use the write-in grids chose to turn over the write-in grid sheet and write out the contest name and their write-in candidate by hand on the back of the sheet. Some wrote all their write-ins on the same sheet, while others used multiple sheets, one for each write-in vote. Interestingly, none of the write-ins that were cast in this manner were deemed invalid due to illegibility; however there is no means for a voter with visual impairments using this method to determine if their vote was validly written and legible.

Another issue related to the write-in sheets is the method for processing those write-in votes, which must remain attached to the ballot for later validation and processing. One of the applicant jurisdictions was stapling the ballot and the write-in sheets together before they were deposited in the ballot box, the other was paper clipping them together. After the “close of the polls”, when the ballot boxes were opened, it was noted that a couple of the paper clipped ballots had come close to being separated from their write-in sheets. If this had happened, the write-in votes would have to be invalidated because it could not be determined if they had been validly cast. For this reason, procedures for use of this system must require that ballots be stapled to their corresponding write-in sheets.

Finally, with the Vote-PAD/DESI system, ballots with write-in sheets attached cannot be fed through the precinct scanner and, instead, must be placed in a bypass compartment in the ballot box for later reconciliation. Because of this, voters casting write-ins on the separate write-in grid sheets – front or back – are not afforded the same over-vote warning protection as are all other voters with the DESI system.

Phase 2 Testing – Ballot Verification

For Phase Two of the test, test participants with visual impairments were asked to stay and verify a premarked ballot using the verification wand. Of the twelve voters with visual impairments that participated in Phase One, nine elected to participate in this second phase of testing.. Of these nine, five were given a DESI ballot to verify and four were given a Hart ballot. All ballots contained at least one under-voted contest and most contained one over-voted contest. Each ballot also had two accompanying

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write-in sheets that had been completed with write-in candidate names according to system use procedures. The verification process was proctored in one of two ways. In some instances, the monitor required the voter to identify the name of the candidate that had been voted. In other instances, the monitor simply required the voter to identify the voted candidate positions within each contest. (i.e. “third candidate”, “fifth candidate”)

Table 6, below, summarizes the results of that testing.

PHASE 2 VERIFICATION			
	Vote-PAD /DESI	Vote-PAD /HART	Combined
Total Contests Verified	130	112	242
Contests Incorrectly Verified	23	16	39
Error Rate	17.7%	14.3%	16.1%
Over-Voted Contests	5	1	6
# Incorrectly Verified	3	0	3
Under-Voted Contests	5	5	10
# Incorrectly Verified	0	1	1
Write-In Contests	10	8	18
# Incorrectly Verified (including write-in name)	0	0	0
Table 5 - Phase 2 Verification Results			

Overall, the percentage of contests incorrectly verified on the Vote-PAD/DESI system was 17.7%, and for the Vote-PAD/Hart system the error rate was 14.3%. The rate of contests incorrectly verified for both systems combined was 16.1%. Not one person was able to correctly verify an entire ballot.

No one was able to correctly identify the common name write-ins on the pre-marked write-in grid sheet. Many of the test voters actually refused to try, complaining that the grid was too complicated. During

PHASE 2 VERIFICATION - Adjusted			
	Vote-PAD /DESI	Vote-PAD /HART	Combined
Total Contests Verified	120	104	224
Contests Incorrectly Verified	13	8	21
Error Rate	10.8%	7.7%	9.4%
Table 6 - Adjusted Phase 2 Error Rates After Omitting Write-In Contests			

testing, the Vote-PAD representative indicated that the verification wand would not be able to accurately read the marks made on the write-in grid for verification because those marks were not wide enough. She noted that the wand would not read marks less than 1/16” thick – a fact not identified in the

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technical specifications for the wand that were provided with the system documentation. In fact, a variety of marks had been made on the Phase Two write-in sheets that were entirely consistent with the marks made by voters in Phase One and with the instructions provided in the Vote-PAD Poll Workers Guide that read:

...The voter indicates the contest to write-in by making a mark, such as a circle or an X in the appropriate cell in the upper grid. ...

In any event, Table 7, above, indicates adjusted verification error rates after removing all write-in contests from the calculation. The combined verification error rate for both systems is still over 9%. It is instructive to note that even after omitting all write-in contests from the calculation, only one voter was able to correctly verify the remainder of the ballot – a test participant with partial vision.

Other Considerations

By its very nature, the Vote-PAD system provides no mechanism for a voter who is blind to verify that they have been provided the correct ballot. It is entirely possible for a poll worker to accidentally – or intentionally – disenfranchise a voter by inserting the wrong ballot into the Vote-PAD booklet. If the Vote-PAD booklet matches the audio or Braille instructions, the voter would never know that he or she was actually voting on the wrong ballot.

A subtler form of disenfranchisement could occur if the poll worker carelessly – or intentionally – placed the ballot in the Vote-PAD in such a manner that the template holes did not properly align with the voting targets on the ballot. In such an instance, the voter who is blind would have no way of knowing that the marginal marks he or she was making were outside of the target area and would not be counted.

To minimize risk of disenfranchisement from these two situations, use procedures for these systems must require that after the ballot is inserted and affixed to the Vote-PAD booklet by a pollworker, a second poll worker must verify that it is the correct ballot for the voter and properly aligned for voting.

One test participant noted that the Vote-PAD would be difficult to use for voters with visual impairments – and who had also lost tactile sensitivity in their fingertips – a condition not uncommon for older citizens, particularly those with diabetes.

A privacy concern with using the Vote-PAD booklet is the risk of someone determining how a ballot was voted on the Vote-PAD from the stray marks in the booklet after the ballot is removed. Test monitors verified in multiple instances that stray marks did, in fact, indicate how a ballot had been voted. Proposed use procedures for the Vote-PAD/DESI system do require once a template is punched, that a marking pen be run around the rim inside each punch to pre-mark those rims. Still in many instances stray marks were left that extended from the punch out on the exterior surface of the ballot template page in the Vote-PAD booklet. The poll workers were observed multiple times cleaning the booklets to remove stray marks, but they were doing so with the ballot template page in full view. When questioned about this, they acknowledged that procedures required they do this with the booklet closed, but had felt that wasn't important during the test. Use procedures for this system should require that the punch holes be pre-marked with a pen as was done for the Vote-PAD/DESI system test. Further, such procedures should also require the booklet to be cleaned thoroughly to remove stray marks after each use in such a manner that the interior pages cannot be viewed until such cleaning has occurred.

Related to stray marks in the Vote-PAD booklet was the issue of stray marks on the voter's fingers. This was of particular concern for many of the voters with visual impairments, and more than one expressed displeasure over this. Procedures should require that all voters using the Vote-PAD booklet to vote be provided with a cleaning wipe to remove the ink from their hands after voting.

Volume Testing

Because the Vote-PAD system is not an electronic voting machine, and because of the logistical difficulties in securing enough people and having them vote the required number of ballots, the Vote-PAD was not subjected to a volume test.

IV. COMPLIANCE WITH STATE AND FEDERAL LAWS AND REGULATIONS

A review of the appropriate Elections Code sections was conducted.

§15360. During the official canvass of every election in which a voting system is used, the official conducting the election shall conduct a public manual tally of the ballots tabulated by those devices cast in 1 percent of the precincts chosen at random by the elections official. If 1 percent of the precincts should be less than one whole precinct, the tally shall be conducted in one precinct chosen at random by the elections official.

In addition to the 1 percent count, the elections official shall, for each race not included in the initial group of precincts, count one additional precinct. The manual tally shall apply only to the race not previously counted.

The proposed systems do not affect this requirement. Each of the base systems, DESI and HART are fully capable of supporting this requirement.

§19300 permit the voter to vote for all the candidates of one party or in part for the candidates of one party and in part for the candidates of one or more other parties.

The proposed systems meet this requirement.

§19301. A voting machine shall provide in the general election for grouping under the name of the office to be voted on, all the candidates for the office with the designation of the parties, if any, by which they were respectively nominated.

The designation may be by usual or reasonable abbreviation of party names.

The proposed systems do not affect this requirement. Each of the base systems, DESI and HART are fully capable of supporting this requirement.

§19302. The labels on voting machines and the way in which candidates' names are grouped shall conform as nearly as possible to the form of ballot provided for in elections where voting machines are not used.

The proposed systems support this requirement.

§19303. If the voting machine is so constructed that a voter can cast a vote in part for presidential electors of one party and in part for those of one or more other parties or those not nominated by any party, it may also be provided with: (a) one device for each party for voting for all the presidential electors of that party by one operation, (b) a ballot label therefore containing only the words “presidential electors” preceded by the name of the party and followed by the names of its candidates for the offices of President and Vice President, and (c) a registering device therefore which shall register the vote cast for the electors when thus voted collectively.

If a voting machine is so constructed that a voter can cast a vote in part for delegates to a national party convention of one party and in part for those of one or more other parties or those not nominated by any party, it may be provided with one device for each party for voting by one operation for each group of candidates to national conventions that may be voted for as a group according to the law governing presidential primaries.

No straight party voting device shall be used except for delegates to a national convention or for presidential electors.

The proposed systems support this requirement.

§19304. A write-in ballot shall be cast in its appropriate place on the machine, or it shall be void and not counted.

Write-in votes using the Vote-PAD booklet may be placed directly on the ballot in the space provided or may be cast on the alternative write-in sheets provided. It is unclear if or how this law would apply to the Vote-PAD systems proposed since voters do not actually vote on a machine. Finally, as noted above in Section III, page 14, some voters had difficulties properly marking their write-in using grid on the write-in sheets, and chose to simply write out the candidate’s name on the back of the sheet.

§19320. Before preparing a voting machine for any general election, the elections official shall mail written notice to the chairperson of the county central committee of at least two of the principal political parties, stating the time and place where machines will be prepared. At the specified time, one representative of each of the political parties shall be afforded an opportunity to see that the machines are in proper condition for use in the election.

The party representatives shall be sworn to perform faithfully their duties but shall not interfere with the officials or assume any of their duties. When a machine has been so examined by the representatives, it shall be sealed with a numbered metal seal. The representatives shall certify to the number of the machines, whether all of the counters are set at zero (000), and the number registered on the protective counter and on the seal.

The proposed systems do not affect this requirement. Each of the base systems, DESI and HART are fully capable of supporting this requirement.

§19321. The elections official shall affix ballot labels to the machines to correspond with the sample ballot for the election. He or she shall employ competent persons to assist him or her in affixing the labels and in putting the machines in order. Each machine shall be tested to ascertain whether it is operating properly.

The proposed systems support this requirement.

§19322. When a voting machine has been properly prepared for an election, it shall be locked against voting and sealed. After that initial preparation, a member of the precinct board or some duly authorized person, other than the one preparing the machines, shall inspect each machine and submit a written report. The report shall note the following: (1) Whether all of the registering counters are set at zero (000), (2) whether the machine is arranged in all respects in good order for the election, (3) whether the machine is locked, (4) the number on the protective counter, (5) the number on the seal. The keys shall be delivered to the election board together with a copy of the written report, made on the proper blanks, stating that the machine is in every way properly prepared for the election.

The proposed systems support this requirement.

§19340. Any member of a precinct board who has not previously attended a training class in the use of the voting machines and the duties of a board member shall be required to do so, unless appointed to fill an emergency vacancy.

The proposed systems do not affect or prohibit compliance with this requirement.

§19341. The precinct board shall consist of one inspector and two judges who shall be appointed and compensated pursuant to the general election laws. One additional inspector or judge shall be appointed for each additional voting machine used in the polling place.

The proposed systems do not affect or prohibit compliance with this requirement.

§19360. Before unsealing the envelope containing the keys and opening the doors concealing the counters the precinct board shall determine that the number on the seal on the machine and the number registered on the protective counter correspond to the numbers on the envelope.

Each member of the precinct board shall then carefully examine the counters to see that each registers zero (000). If the machine is provided with embossing, printing, or photography devices that record the readings of the counters the board shall, instead of opening the counter compartment, cause a “before election proof sheet” to be produced and determined by it that all counters register zero (000).

If any discrepancy is found in the numbers registered on the counters or the “before election proof sheet” the precinct board shall make, sign, and post a written statement attesting to this fact. In filling out the statement of return of votes cast, the precinct board shall subtract any number shown on the counter from the number shown on the counter at the close of the polls.

The proposed systems do not affect this requirement. Each of the base systems, DESI and HART are fully capable of supporting this requirement.

§19361. The keys to the voting machines shall be delivered to the precinct board no later than 12 hours before the opening of the polls. They shall be in an envelope upon which is written the designation and location of the election precinct, the number of the voting machine, the number on the seal, and the number registered on the protective counter. The precinct board member receiving the key shall sign a receipt. The envelope shall not be opened until at least two members of the precinct board are present to determine that the envelope has not been opened. At the close of the polls the keys shall be placed in the envelope supplied by the official and the number of the machine, the number written on the envelope.

The proposed systems do not affect this requirement. Each of the base systems, DESI and HART are fully capable of supporting this requirement.

§19362. The exterior of the voting machine and every part of the polling place shall be in plain view of the election precinct board and the poll watchers.

Each machine shall be at least four feet from the poll clerk's table.

The proposed systems do not affect or prohibit compliance with this requirement.

§19363. Voters shall not remain in or occupy the booths or compartments longer than is necessary to mark their ballots, which shall not exceed five minutes. However, where no other voter would be inconvenienced, a longer period shall be allowed.

As noted above in Section III, page 12, use of the Vote-PAD system for voting generally takes considerably longer than five minutes.

§19370. As soon as the polls are closed, the precinct board, in the presence of the watchers and all others lawfully present, shall immediately lock the voting machine against voting and open the counting compartments, giving full view of all counter numbers. A board member shall in the order of the offices as their titles are arranged on the machine, read and distinctly announce the name or designating number and letter on each counter for each candidate's name and the result as shown by the counter numbers. He or she shall also in the same manner announce the vote on each measure.

If the machine is provided with a recording device, in lieu of opening the counter compartment the precinct board shall proceed to operate the mechanism to produce the statement of return of votes cast record in a minimum of three copies, remove the irregular ballot, if any, record on the statement of return of votes cast record. The irregular ballot shall, be attached to the statement of result record of votes cast for the machine and become a part thereof. One copy of the statement of return of votes cast for each machine shall be posted upon the outside wall of the precinct for all to see. The statement of return of votes cast for each machine for the precinct shall constitute the precinct statement of result of votes cast.

The proposed systems do not affect this requirement. Each of the base systems, DESI and HART are fully capable of supporting this requirement.

§19371. Before adjourning, the precinct board shall seal the operating lever with the seal provided and lock the machine so that the voting and counting mechanism may not be operated.

It shall remain locked and sealed against operation until the time for filing a contest of election has expired, which shall not exceed a period of 30 days following the declaration of the result of the election by the body canvassing the returns.

This requirement does not apply to the proposed systems.

§19380. During the reading of the result of votes cast, any candidate or watcher who may desire to be present shall be admitted to the polling place. The proclamation of the result of the votes cast shall be distinctly announced by the precinct board who shall read the name of each candidate, or the designating number and letter of his or her counter, and the vote registered on the counter. The board shall also read the vote cast for and against each measure submitted. The board shall not count votes cast for write-in candidates, but shall have these counted by the elections official. During the proclamation, many opportunities shall be given to any person lawfully present to compare the result so announced with the counter dials of the machine, and any necessary corrections shall immediately be made by the precinct board, after which the doors of the voting machine shall be closed and locked.

If the machine is provided with a recording device, the alternate procedures in Section 19370 may be used.

The proposed systems do not affect this requirement. The proposed Vote-PAD/DESI system is fully capable of supporting this requirement. This requirement does not apply to the proposed Vote-PAD/Hart system since tabulation does not take place in the polling place with this system.

§19381. In each election district where voting machines are used, statements of the results of the vote cast shall be printed to conform with the type of voting machine used.

The designating number and letter on the counter for each candidate shall be printed next to the candidate's name on the statements of result of the vote cast. Two such statements shall be used in each election district.

The proposed systems do not affect this requirement. The proposed Vote-PAD/DESI system is fully capable of supporting this requirement. This requirement does not apply to the proposed Vote-PAD/Hart system since tabulation does not take place in the polling place with this system.

§19382. The statement of the result of votes cast, which shall be certified by the precinct board, shall contain:

- (a) The total number of votes cast.**
- (b) The number of votes cast for each candidate and measure as shown on the counter.**
- (c) The number of votes for persons not nominated.**
- (d) Printed directions to the precinct board for their guidance before the polls are opened and when the polls are closed.**
- (e) A certificate, which shall be signed by the election officers before the polls are opened, showing:**

- (1) The delivery of the keys in a sealed envelope.
- (2) The number on the seal.
- (3) The number registered on the protective counter.
- (4) Whether all of the counters are set at zero (000).
- (5) Whether the public counter is set at zero (000).
- (6) Whether the ballot labels are properly placed in the machine.
- (f) A certificate that shall be filled out after the polls have been closed, showing:
 - (1) That the machine has been locked against voting and sealed.
 - (2) The number of voters as shown on the public counter.
 - (3) The number on the seal.
 - (4) The number registered on the protective counter.
 - (5) That the voting machine is closed and locked.

The proposed systems do not affect this requirement. The proposed Vote-PAD/DESI system is fully capable of supporting this requirement. This requirement does not apply to the proposed Vote-PAD/Hart system since tabulation does not take place in the polling place with this system.

§19383. A member of the precinct board shall enter the vote, as registered, on the statements of result of votes cast, in the same order on the space that has the same name or designating number and letter, after which another member shall verify the figures by calling them off in the same manner from the counters of the machine.

The counter compartment of the voting machine shall remain open until the official returns and all other reports have been fully completed and verified by the precinct board.

If the machine is provided with a recording device, the alternate procedures in Section 19370 may be used.

The proposed systems do not affect this requirement. The proposed Vote-PAD/DESI system is fully capable of supporting this requirement. This requirement does not apply to the proposed Vote-PAD/Hart system since tabulation does not take place in the polling place with this system.

§19384. The precinct board shall, before it adjourns, post conspicuously on the outside of the polling place a copy of the result of the votes cast at the polling place. The copy of the result shall be signed by the members of the precinct board.

If the machine is provided with a recording device, the statement of result of vote's cast produced by operating its mechanism may be considered the "result of the votes cast" at the polling place.

The proposed systems do not affect this requirement. The proposed Vote-PAD/DESI system is fully capable of supporting this requirement. This requirement does not apply to the proposed Vote-PAD/Hart system since tabulation does not take place in the polling place with this system.

§19385. The precinct board shall immediately transmit unsealed to the elections official a copy of the result of the votes cast at the polling place, the copy shall be signed by the members of the precinct board, and shall be open to public inspection.

The proposed systems do not affect this requirement. The proposed Vote-PAD/DESI system is fully capable of supporting this requirement. This requirement does not apply to the proposed Vote-PAD/Hart system since tabulation does not take place in the polling place with this system.

§19386. Before proceeding to canvass the returns of an election at which voting machines have been used to register the votes cast, the board authorized to canvass returns shall open the counter compartment and compare the records of votes cast for the several candidates voted for and for and against the several measures voted upon shown on each machine with those recorded on the statement of results of votes cast prepared from that machine by the precinct board. Any errors found on the statement shall be corrected by crossing out the recorded incorrect number, and recording the correct number nearby.

The proposed systems do not affect this requirement. The proposed Vote-PAD/DESI system is fully capable of supporting this requirement. This requirement does not apply to the proposed Vote-PAD/Hart system since tabulation does not take place in the polling place with this system.

A review of federal statutes or regulations, which address the application.

The Voting Rights Act of 1965, as amended (42 U.S.C. 1973), requires all elections in certain covered jurisdictions to provide registration and voting materials and oral assistance in the language of a qualified language minority group in addition to English. Currently in California, there are six VRA languages (Spanish, Chinese, Japanese, Vietnamese, Korean and Tagalog) as prescribed under the law.

The proposed systems are fully capable of supporting this requirement.

The National Voter Registration Act of 1993 (42 U.S.C. 1973gg and 11 CFR 8) allows for the casting of provisional ballots through Fail-Safe Voting procedures.

The proposed systems do not affect this requirement. Each of the base systems, DESI and HART, are fully capable of supporting this requirement.

The Voting Accessibility for the Elderly and Handicapped Act of 1984 (42 U.S.C. 1973ee through 1973ee-6) requires each political subdivision conducting elections within each state to assure that all polling places for federal elections are accessible to elderly and handicapped voters, except in the case of an emergency as determined by the state's chief election officer or unless the state's chief election officer: (1) determines, by surveying all potential polling places, that no such place in the area is accessible or can be made temporarily accessible, and (2) assures that any handicapped voter assigned to an inaccessible polling place will, upon advance request under established state procedures, either be assigned to an accessible polling place or be provided an alternative means of casting a ballot on election day.

The proposed voting systems do not affect the physical accessibility of the polling place itself. Proponents of the Vote-PAD argue that the Vote-PAD system enhances the accessibility of the polling place by providing a method of voters with disabilities to mark a paper ballot.

The Retention of Voting Documentation (42 U.S.C. 1974 through 1974e) statute applies in all jurisdictions and to all elections in which a federal candidate is on a ballot. It requires elections officials to preserve for 22 months all records and papers which came into their possession relating to an application, registration, payment of a poll tax, or other act requisite to voting. Note: The US Department of Justice considers this law to cover all voter registration records, all poll lists and similar documents reflecting the identity of voters casting ballots at the polls, all applications for absentee ballots, all envelopes in which absentee ballots are returned for tabulation, all documents containing oaths of voters, all documents relating to challenges to voters or absentee ballots, all tally sheets and canvass reports, all records reflecting the appointment of persons entitled to act as poll officials or poll watchers, and all computer programs used to tabulate votes electronically. In addition, it is the Department of Justice’s view that the phrase “other act requisite to voting” requires the retention of the ballots themselves, at least in those jurisdictions where a voter’s electoral preference is manifested by marking a piece of paper or by punching holes in a computer card.

The proposed systems do not affect this requirement. Each of the base systems, DESI and HART, are fully capable of supporting this requirement.

V. PUBLIC COMMENT

On July 21, 2006, a stakeholders demonstration of this system was held at the Secretary of State’s Office for invited representatives of the accessibility community, as well as county elections officials and members of the VSTAAB, to observe and review this system with Secretary of State and vendor staff.

Participants included:

- three representatives of the accessibility community,
- two representatives of the VSTAAB, and
- members of the Secretary of State staff.

Participants in this event were asked to submit written comments on the system and any comments received will be presented to the Secretary of State.

VI. RECOMMENDATION

Staff does not recommend certification of either the proposed Vote-PAD/DESI or of the proposed Vote-PAD/Hart system for the following reasons:

- The demonstrated error rates for voters to cast a ballot using the Vote-PAD is unacceptably high – particularly for voters with visual impairments;
- Voters with visual impairment cannot reliably cast a write-in ballot using this system;
- There is no reliable method for voters with visual disabilities to independently verify their complete ballot, or even that they have been issued the correct ballot and that it has been properly aligned in the Vote-PAD booklet; and

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- The length of time involved for voters with visual impairments to cast a ballot is excessive and likely to have a negative impact on voter participation.

Appendix A- Vote-PAD/DESI & Vote-PAD/Hart Testing Protocol

Proposed Test Plan for Vote-PAD Use In Conjunction with the Diebold AccuVote-OS (Optical Scan) System and the Hart Ballot Now Voting Systems

Goal: To appraise the usability, reliability, privacy and accuracy of the Vote-PAD system when used in accordance with the proposed use procedures for each respective system.

Test Overview: Testing will take place at the Secretary of State's Office in Sacramento. The accessibility advocacy community will be solicited for voters with disabilities representing a range of disability modalities. Test voters will be scheduled to arrive at varying times throughout the test. Every test voter will be asked to participate in Phase 1 of the test, which will measure the ability of the "voters" to accurately mark their ballots with their vote choices. Voters with visual impairments will also be asked to participate in Phase 2 of the test to gauge the ability to accurately verify a ballot and determine how it was voted.

Test Participants: As mentioned above, local accessibility advocacy organizations, such as Protection and Advocacy, Inc., the California Foundation for Independent Living Centers and The California Council of the Blind, will be contacted and solicited for test participants. A day (or days) will be selected for the testing to take place based on room and staff availability and availability of a sufficient number of participants. Applicant counties are encouraged to contact their local accessibility advocacy community to recruit participants for the test as well.

Test Protocol:

Each of the county applicants will select their longest ballot style from the June 2006 Primary Election. Each will prepare five (5) Vote-PAD, five (5) audio instruction cassettes, five (5) verification wands, two (2) Braille booklets and one (1) large-font instruction book based on that ballot style.

Each county staff will also supply two persons to serve as "poll workers" throughout the test. These "poll workers" will be responsible for setting up the voting experience for each test participant *in accordance with the proposed use procedures for that respective system*. This 'set up' will include preparing the ballot in the Vote-PAD booklet for voting, supplying the voter with appropriate equipment for using the Vote-PAD (e.g., audio cassette & headphones, verification wand, non-slip pads, write-in ballots, etc), and providing basic instruction for the voter to get started.

Each voter will be directly monitored by Secretary of State Staff or Secretary of State consultant. These "monitors" will monitor and evaluate the entire experience for each voter, beginning with check-in and initial instruction, through actual Phase 1 and Phase 2 testing. At

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the conclusion of each participant's testing, these monitors will conduct a brief survey of the participating voter, focusing on usability and satisfaction with the system.

All ballots will be sequentially numbered for tracking and comparing accuracy of ballot marking and scanning as compared with voter intent.

Participant test voters will be randomly assigned to either the Diebold blended system or the Hart blended system for testing purposes.

During Phase 1, the voter will be asked to vote a ballot. As the voter records his or her vote choice for each contest, the voter will be asked to state aloud for the monitor the vote choice that voter believes he or she is marking on the ballot. The monitor will record the vote choices as stated by the participant voter. At times, the monitor will randomly direct the voter to:

- Skip a contest and then later return to the contest to record the vote; and/or
- Vote a specific write-in candidate for a particular contest.

At the conclusion of Phase 1, each test participant with visual impairments will be asked to participate in Phase 2 of the test.

During Phase 2, the participant will be provided a pre-marked ballot and asked to determine ("verify") the vote choices on that ballot. For each contest, the participant will be asked to state aloud the vote choice(s) he or she believes was voted for that contest. The monitor will record those votes as 'verified' by the participant for later comparison against the actual ballot.

Voted ballots in this phase will include contests that are over-voted or under-voted. They will also include contests with write-ins recorded on the write-in sheet.

At the conclusion of each test voting experience, the participant will be briefly surveyed by the monitor. That survey will focus on the participant's demographics, experience with accessible voting systems and perceptions of the test experience. In addition to the vote choices or "verifications," the monitor will also record the time involved for voter instruction and training, time taken to vote the ballot, time taken to verify the ballot, and any difficulties observed in the voting process.

At the conclusion of all test voting, all ballots voted in Phase 1 will be tabulated by the respective voting system in accordance with proposed use procedures for that blended system. This tabulation will be done at the direction of the Secretary of State Staff. Totals will be generated and the reports compared to the sum of the vote choices recorded by the monitors.

All testing will be recorded by videotape. All recordings will remain the property of the Secretary of State. All recordings will be made publicly available upon release of the Secretary of State's Staff Report from system testing.

Evaluation of the Systems: In terms of accuracy for the system to capture and record the voter's intent, the blended systems will be deemed an automatic pass if the error rate in Phase 1 voting (actual votes read and tabulated compared to stated vote choices) and in Phase 2 verification (stated 'verifications' compared to actual ballot) are below the threshold error rates in the 2002 Voting System Standards.

Each blended system will also be subjectively evaluated for usability, reliability and privacy in accordance with the proposed use procedures for that system, based on direct observation by Secretary of State Staff and/or the State's Consultants and upon survey feedback by test participants.

Additional Conditions

- ❑ **No interference:** Once preliminary voter instruction is completed, the applicant staff, including "poll workers", may not interact with any test participants unless authorized by the Secretary of State monitor.
- ❑ **Observers:** The Secretary of State may designate up to three official observers of the test. Each applicant may have up to three designated observers of the test. Additional observers will be allowed upon the mutual agreement of the Secretary of State and *all* applicants. All observers will be physically restricted to the designated observer area and may not interfere with the test in any manner.
- ❑ **Confidentiality:** All test participants and observers will be required to execute a confidentiality agreement, prohibiting discussion of the test in any manner until the Secretary of State has publicly released its report from the test.

Responsibilities:

The Applicants for each system will be jointly responsible for supplying:

- ❑ 400 blank ballots (each applicant) of the single largest ballot style from the June 2006 Primary Election for that county;
- ❑ Five Vote-PAD booklets prepared for the above ballots with five matching audio instruction sets (cassette tape or CD, depending on the audio device proposed for the system), two Braille ballot instruction booklets and one large-print instruction book based on that ballot style. Each is to be prepared in accordance with the Vote-PAD vendor instructions and the proposed system use procedures;
- ❑ Five verification wands (each applicant) of the model proposed in the application;
- ❑ Sufficient accessories and supplies, such as audio playback devices, ballot marking pens, non-skid pads, etc. to outfit five voters voting simultaneously. For all such devices, the equipment supplied must meet the specifications identified in the application. Where specifications are not identified for a device (such as the audio playback device), it will be assumed that the actual product and model supplied for testing will be the actual product that will be used at the polls, and certification will be based on that specific product;
- ❑ Predefined election databases for each system, configured to read and tally the above ballots for each system;
- ❑ All necessary hardware and software, including servers, scanners, printers and memory devices to tabulate and report vote results from the test election;

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- ❑ Five camcorders with tripods and sufficient videotape to capture and document all testing activity;
- ❑ At least two persons from each applicant county who are trained in the proposed use procedures for that blended system to serve as “poll workers” throughout the test; and
- ❑ Necessary staff to setup and operate all voting system equipment.

Additionally, the applicants will be jointly responsible for all costs directly associated with the test, including:

- ❑ The cost for services of the technical consultants hired by the Secretary of State to conduct the test and review all application materials, as well as their associated travel expenses;
- ❑ The cost to provide security for the event; and
- ❑ The cost to supply all necessary supplies and materials to conduct the test.

The Secretary of State will be responsible for:

- ❑ Securing the location of the testing;
- ❑ Arranging security at the event, including identification badges for all participants;
- ❑ Providing and training all test monitors;
- ❑ Developing voting ‘scripts’ for Phase 1 of the test and pre-marking ballots for Phase 2 of the test; and
- ❑ Developing necessary forms and procedures for documenting the testing experience of each voter, and the post-election survey of participants.

Appendix B- Procedures for “Poll Workers” for Vote-PAD Blended System Testing

During check-in

1. When the voter is brought over by the Monitor, introduce yourself.
2. Note the voter number on the ballot and two write-in sheets. Insert the ballot into a Vote-PAD booklet and prepare for voting.
3. Assign the voter to a voting station and escort the voter to that station, positioning the voter properly for voting.
4. The Monitor will read a brief statement to the voter explaining the test.
5. When done, the Monitor will ask you to instruct the voter. Please instruct the voter as you would in an actual polling place and in accordance with the proposed procedures for the voting system.
6. You should be sure the voting station is equipped with all appropriate equipment and supplies to vote his or her ballot, including a privacy sleeve.
7. At the conclusion of instruction, you should return to the poll workers station.
8. If the voter has additional questions or needs clarification, the voter may request further instruction. It is permissible to answer any additional instruction the voter may have, but you may not assist in the actual voting or verifying process. If in doubt, please get permission from the Monitor working with that voter.
9. All preparation, instruction and processing should be done in accordance with the proposed Use Procedures for the voting system.

Appendix C- Monitor Record for Testing of Proposed Vote-PAD/DESI System

Voter Number: _____

Date: _____

Monitor: _____

TIMING

Voter Instruction	
Time Started	
Time Finished	
Total Time	

Voting	
Time Started	
Time Finished	
Total Time	

Phase 1 – Test Voting

GOVERNOR	
	REINHOLD GULKE
	GRAY DAVIS
	IRIS ADAM
	PETER MIGUEL CAMEJO
	GARY DAVID COPELAND
	BILL SIMON
	W/I:

LT GOVERNOR	
	PAUL JERRY HANNOSH
	BRUCE MC PHERSON
	KALEE PRZYBYLAK
	CRUZ M BUSTAMANTE
	JIM KING
	DONNA J WARREN
	PAT WRIGHT
	W/I:

SECRETARY OF STATE	
	<i>Please skip the contest and</i>

	<i>vote for none of the candidates</i>

CONTROLLER	
	TOM MCCLINTOCK
	ERNEST F VANCE
	J CARLOS AGUIRRE
	STEVE WESTLY
	LAURA WELLS
	W/I:

TREASURER	
	SYLVIA VALENTINE
	NATHAN E JOHNSON
	PHIL ANGELIDES
	GREG CONLON
	MARIAN SMITHSON
	JEANNE-MARIE ROSENMEIER
	W/I:

ATTORNEY GENERAL	
	Please vote for write-in candidate: "George Washington"

**PLEASE BACK UP AND VOTE FOR
SECRETARY OF STATE:**

- LARRY SHOUP

SECRETARY OF STATE	
	LARRY SHOUP

**PLEASE RESUME VOTING THE BALLOT
WHERE YOU LEFT OFF**

INSURANCE COMMISSIONER	
	GARY MENDOZA
	JOHN GARAMENDI
	STEVE KLEIN
	RAUL CALDERON, JR
	DALE F OGDEN
	DAVID I SHEIDLOWER
	W/I:

BD OF EQUALIZATION DISTRICT 1	
	Please vote for write-in candidate: "Betsy Ross"

US REPRESENTATIVE – DISTRICT 2	
	WALLY HERGER
	CHARLES R. MARTIN
	MIKE JOHNSON
	PATRICE THIESSEN
	W/I:

STATE SENATOR – DISTRICT 4	
	MARIANNE SMITH
	ROBERT H UNDERWOOD
	SAMUEL AANESTAD

	W/I:
--	------

MEMBER ASSEMBLY – DISTRICT 1	
	Please vote for write-in candidate: "Benjamin Franklin"

JUDICIAL – SUPREME COURT

CARLOS MORENO	
	YES
	NO

MARVIN R BAXTER	
	YES
	NO

KATHRYN M WERDEGAR	
	YES
	NO

COURT OF APPEALS – 3RD DISTRICT

ARTHUR G SCOTLAND	
	YES
	NO

ROD DAVIS	
	YES
	NO

DANIEL M KOLKEY	
	YES
	NO

RICHARD SIMS	
	YES
	NO

VANCE W RAYE	
	YES
	NO

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RONALD B ROBIE	
<input type="checkbox"/>	YES
<input type="checkbox"/>	NO

SUPERIOR COURT JUDGE	
<input type="checkbox"/>	Please vote for write-in candidate: "TOM CRUISE"

SUPERINTENDENT OF PUBLIC INSTRUCTION	
<input type="checkbox"/>	JACK O'CONNELL
<input type="checkbox"/>	KATHERINE H SMITH
<input type="checkbox"/>	W/I:

BALLOT MEASURES

Prop 46- Housing & Emergency...	
<input type="checkbox"/>	YES
<input type="checkbox"/>	NO

Prop 47- Kindergarten & University...	
<input type="checkbox"/>	YES
<input type="checkbox"/>	NO

Prop 48- Court Consolidation...	
<input type="checkbox"/>	Please skip the contest and

<input type="checkbox"/>	vote for neither yes or no
--------------------------	----------------------------

Prop 49- Before & After School...	
<input type="checkbox"/>	Please skip the contest and vote for neither yes or no

Prop 50- Water Quality, Supply...	
<input type="checkbox"/>	YES
<input type="checkbox"/>	NO

Prop 51- Transportation Distrib...	
<input type="checkbox"/>	YES
<input type="checkbox"/>	NO

PLEASE BACK UP AND VOTE "NO" for PROPOSITION 48:

Prop 48- Court Consolidation...	
<input type="checkbox"/>	NO

PLEASE RESUME VOTING THE BALLOT WHERE YOU LEFT OFF

Prop 52- Election Day Voter Regist...	
<input type="checkbox"/>	YES
<input type="checkbox"/>	NO

Vote-PAD/Hart MONITOR RECORD

PHASE 1 OBSERVANCES

1. Were all vote choices correctly recorded? _____ Yes _____ No
If not, how many were incorrectly recorded? _____
2. Did the voter appear to have problems following the instructions? _____ Yes _____ No
If 'yes', please explain:
3. Did the voter appear to have problems navigating the ballot? _____ Yes _____ No
If 'yes', please explain:
4. Did the voter appear to have problems marking the ballot? _____ Yes _____ No
If 'yes', please explain:
5. Was the voter able to vote privately and independently? _____ Yes _____ No
If 'no', please explain:
6. Were the proposed Use Procedures followed? _____ Yes _____ No
If 'no', please explain:
7. What, if anything, did the voter use for instructions on navigating the ballot? (e.g. audio tape, Braille booklet, etc)

Vote-PAD/Hart MONITOR RECORD

8. Did the voter use the verification wand to verify vote choices?

_____ Yes

_____ No

9. Can the voter's vote choices be determined by inspecting the Vote-PAD booklet?

_____ Yes

_____ No

If 'yes', please document with photos

10. Please note any other issues observed:

Vote-PAD/Hart MONITOR RECORD

Appendix D- Monitor Record for Testing of Proposed Vote-PAD/Hart System

Voter Number: _____

Date: _____

Monitor: _____

TIMING

Voter Instruction	
Time Started	
Time Finished	
Total Time	

Voting	
Time Started	
Time Finished	
Total Time	

Phase 1 – Test Voting

GOVERNOR	
	FRANK A MACALUSO JR
	PHIL ANGELIDES
	JERALD ROBERT GERST
	VIBERT GREENE
	BARBARA BECNEL
	JOE BROUILLETTE
	MICHAEL STRIMLING
	STEVE WESTLY
	W/I:

LT GOVERNOR	
	LIZ FIGUREROA
	JACKIE SPEIER
	JOHN GARAMENDI
	W/I:

SECRETARY OF STATE	
	<i>Please skip the contest and vote for none of the candidates</i>

CONTROLLER	
	JOHN CHIANG
	JOE DUNN
	W/I:

TREASURER	
	BILL LOCKYER
	W/I:

ATTORNEY GENERAL	
	<i>Please vote for write-in candidate: "George Washington"</i>

PLEASE BACK UP AND VOTE FOR SECRETARY OF STATE:

- **DEBORAH V ORTIZ**

Vote-PAD/Hart MONITOR RECORD

SECRETARY OF STATE	
	DEBORAH V ORTIZ

**PLEASE RESUME VOTING THE BALLOT
WHERE YOU LEFT OFF**

INSURANCE COMMISSIONER	
	CRUZ M BUSTAMANTE
	JOHN KRAFT
	W/I:

US REPRESENTATIVE – DISTRICT 1	
	MIKE THOMPSON
	W/I:

MEMBER ASSEMBLY – DISTRICT 8	
	<i>Please vote for write-in candidate: “Benjamin Franklin”</i>

SUPERINTENDENT OF PUBLIC INSTRUCTION	
	SARAH L KNOPP
	DANIEL L BUNTING
	GRANT MC MICKEN
	DIANE A LENNING
	JACK O’CONNELL
	W/I:

COUNTY SUPERINTENDENT OF SCHOOLS	
	JORGE O AYALA
	W/I:

BD OF EQUALIZATION DISTRICT 1	
	<i>Please vote for write-in candidate: “Betsy Ross”</i>

US SENATOR	
	COLLEEN FERNALD
	DIANNE FEINSTEIN
	MARTIN LUTHER CHURCH
	W/I:

COUNTY OFFICES

SUPERVISOR – DISTRICT 3	
	BRENDA ELAINE CEDARBLADE
	MATT REXROAD
	FRANK SIEFERMAN, JR
	W/I:

ASSESSOR	
	JOEL BUTLER
	BOB MILBRODT
	W/I:

AUDITOR-CONTROLLER /TREASURER TAX COLLECTOR	
	<i>Please vote for write-in candidate: “Tom Cruise”</i>

COUNTY CLERK/RECORDER	
	FREDDIE OAKLEY
	W/I:

DISTRICT ATTORNEY	
	PATRICIA RAE LENZI
	JEFF REISIG
	W/I:

Vote-PAD/Hart MONITOR RECORD

PUBLIC GUARDIAN/ADMINIS TRAT.	
	CASS SYLVIA
	W/I:

SHERIFF-CORONER	
	ED PRIETO
	W/I:

CITY OFFICES

WOODLAND CITY COUNCIL (Vote for two)	
	MARLIN H "SKIP" DAVIES
	DAN RYHAL
	XAVIER C TAFOYA
	BILL MARBLE
	W/I:

BALLOT MEASURES

Prop 81- California Reading & ...	
	YES
	NO

Prop 82- Preschool Education. ...	
	<i>Please skip the contest and vote for neither yes or no</i>

Woodland – Measure A	
	<i>Please skip the contest and vote for neither yes or no</i>

Woodland – Measure B	
	YES
	NO

Woodland – Measure C	
	YES

	NO
--	----

**PLEASE BACK UP AND VOTE "NO" for
PROPOSITION 82:**

Prop 82- Court Consolidation...	
	NO

**PLEASE RESUME VOTING THE BALLOT
WHERE YOU LEFT OFF**

Woodland – Measure D	
	YES
	NO

Woodland – Measure E	
	YES
	NO

PHASE 1 OBSERVANCES

11. Were all vote choices correctly recorded? _____ Yes _____ No

If not, how many were incorrectly recorded? _____

12. Did the voter appear to have problems following the instructions? _____ Yes _____ No

If 'yes', please explain:

13. Did the voter appear to have problems navigating the ballot? _____ Yes _____ No

If 'yes', please explain:

14. Did the voter appear to have problems marking the ballot? _____ Yes _____ No

If 'yes', please explain:

15. Was the voter able to vote privately and independently? _____ Yes _____ No

If 'no', please explain:

16. Were the proposed Use Procedures followed? _____ Yes _____ No

If 'no', please explain:

17. What, if anything, did the voter use for instructions on navigating the ballot? (e.g. audio tape, Braille booklet, etc)

18. Did the voter use the verification wand to verify vote choices? _____ Yes _____ No

19. Can the voter's vote choices be determined by inspecting the Vote-PAD booklet?

_____ Yes

_____ No

If 'yes', please document with photos

20. Please note any other issues observed:

Appendix E- Monitor Record for Testing of Proposed Vote-PAD/DESI System

About the voting experience

1. Do you feel the Vote-PAD would allowed you to vote privately? ☐ Yes ☐ No
2. Do you feel the Vote-PAD would allowed you to vote independently? ☐ Yes ☐ No
3. How confident are you that your vote was accurately recorded
*Very Confident Somewhat Confident Neutral Somewhat Concerned Very Concerned
(Not at all confident)*

4. How easy or difficult was it to vote with the Vote-PAD
Very Easy Somewhat Easy Neutral Somewhat Difficult Very Difficult

5. Have you voted on other accessible voting equipment? ☐ Yes ☐ No
If "yes",

In general, how would you rate the Vote-PAD against the other equipment in terms of ease-of-use?

*Much Easier Somewhat Easier About the Same Somewhat More Much More Difficult
Difficult*

6. Any thoughts you would like to share about your experience voting with the Vote-PAD?

About you, the test participant

7. May I ask you to identify your disability (ies) and how long you have had each disability?

8. What age group are you in?

- ☐ 18 – 25 yrs of age
- ☐ 25 - 35 yrs of age
- ☐ 35 - 45 yrs of age
- ☐ 45 - 55 yrs of age
- ☐ 55 – 65 yrs of age
- ☐ over 65 yrs of age

9. Are you a member of any advocacy groups? ☐ Yes ☐ No *If so, which groups?*

10. How did you hear of this test?

Appendix F- Vote-PAD/DESI System Error Data by Voter

		Mobility	Mobility	Blind	Dexterity	Dexterity	Blind-Devl	Devl	Blind	Dexterity	Dexterity	Blind	PartVision	Blind	Dexterity	Blind	Mobility	PartVision	
BALLOT #		101	103	104	106	109	110	111	114	115	118	121	201	203	204	205	207	208	TOTAL
Overall																			
Total Contests Voted		29	29	29	29	29	1	5	29	29	29	29	29	29	29	29	29	29	441
Contests correctly voted		29	29	28	29	28	0	2	24	22	29	28	28	26	29	13	29	24	397
% voted invalid		0%	0%	3%	0%	3%	100%	60%	17%	24%	0%	3%	3%	10%	0%	55%	0%	17%	10.0%
General Errors																			
Navigation (wrong target)		0	0	0	0	0	1	4	2	0	0	1	0	0	0	4	0	0	12
Stray Markings (Overvotes, etc)		0	0	1	0	0	0	1	0	0	0	1	0	0	0	3	0	0	6
Marginal mark from ballot alignment		0	0	0	0	0	0	0	2	3	0	0	0	0	0	5	0	1	11
Write-Ins- SLOT		4	4		0	4	0	0		4		2			3		4		25
Skipped W/I Target		0	0		0	1	0	0		0		0			0		0		1
Illegible Name		0	0		0	0	0	0		4		0			0		0		4
Write-Ins- GRID									4				3			4			11
Skipped W/I Target									0				0			3			3
Bad/Missing Contest # on grid									2				0			4			6
Invalid/unreadable name									0				1			0			1
Missing Grid Sheet									0				0			0			0
Write-Ins- Longhand on back of grid sheet				4							4	2		4				4	18
Skipped W/I Target				0							0	0		3				4	7
Illegible Name				0							0	0		0				0	0

Instruction Time (minutes)	6	35	17	8	9	15	15	23	8	7	19	25	72	7	10	7	17	Count
																		Totals
																		Avg
Voting Time (minutes)	6	10	111	26	16	48	25	70	17	33		64	80	9	47	17	96	Count
																		Totals
																		Avg

Appendix G- Vote-PAD/HART System Error Data by Voter

	Mobility	Dexterity	Blind	Devl	PartVision	PartVision	Dexterity	Dexterity	Dexterity	Blind?	Dexterity	Dexterity	Blind	Dexterity	
BALLOT #	105	107	108	112	113	116	117	120	129	202	206	209	210	211	TOTAL
Overall															
Total Contests Voted	28	28	28	28	28	28	28	28	28	28	28	28	28	28	392
Contests correctly voted	28	27	21	20	23	25	25	28	26	20	27	28	25	27	350
% voted invalid	0%	4%	25%	29%	18%	11%	11%	0%	7%	29%	4%	0%	11%	4%	10.7%
General Errors															
Navigation (wrong target)	0	0	4	2	3		0	0	0	4	0	0	0	0	13
Stray Markings (Overvotes, etc)	0	0	1	1	0		0	0	0	0	0	0	0	0	2
Marginal mark not read				1											
Write-Ins- SLOT	4	6	4	5		3	3	5	3	7	4	3			47
Skipped W/I Target	0	1	1	2		0	3	0	0	0	0	0			7
Illegible Name	0	0	3	4		3	2	0	1	3	1	0			17
Write-Ins- GRID			1		2				1		2		3	4	13
Skipped W/I Target			0		0				0		0		3	0	3
Bad/Missing Contest # on grid			0		2				1		0		0	0	3
Invalid/unreadable name			0		2				0		0		0	0	2
Missing Grid Sheet			0						0		0		0	1	1
Write-Ins- Longhand on back of grid sheet															
Skipped W/I Target															
Illegible Name															

Instruction Time (minutes)	2	9	16	5	33	15	6	8	12	21	27	5	8	
Voting Time (minutes)	9	11	39	30	44	22		10	47	39	38	9	44	

Appendix H- Vote-PAD/DESI System Error Data by Contest

	VOTER INTENT	RESULT TAPES	ERRORS IN COUNT	BALLOT INSPECT
GOVERNOR				
REINHOLD GULKE	0	0	0	0
GRAY DAVIS	5	3	2	3
IRIS ADAM	3	4	1	4
PETER MIGUEL CAMEJO	2	2	0	2
GARY DAVID COPELAND	2	2	0	2
BILL SIMON	3	2	1	2
W/I: Other/Uncertified	0	0	0	
OVER VOTE	2		0	2
UNDER VOTE	0		2	2
TOTAL	17	13	6	17
LT GOVERNOR				
PAUL JERRY HANNOSH	0	0	0	
BRUCE MC PHERSON	5	3	2	3
KALEE PRZYBYLAK	0	0	0	
CRUZ M BUSTAMANTE	5	5	0	5
JIM KING	4	3	1	3
DONNA J WARREN	0	0	0	
PAT WRIGHT	1	1	0	1
W/I: Other/Uncertified	1	1	0	1
OVER VOTE	0		2	2
UNDER VOTE	1		1	2
TOTAL	17	13	6	17
SECRETARY OF STATE				
EDWARD C NOONAN	0	0	0	0
LOUISE MARIE ALLISON	0	0	0	0
KEITH OLBERG	0	0	0	0
KEVIN SHELLEY	0	0	0	0
VALLI SHARPE-EISLER	0	0	0	0
LARRY SHOUP	15	15	0	15
GAIL K LIGHTFOOT	0	0	0	0
W/I: Other/Uncertified	0	0	0	0
OVER VOTE	0		0	0
UNDER VOTE	2		0	2

	VOTER INTENT	RESULT TAPES	ERRORS IN COUNT	BALLOT INSPECT
TOTAL	17	15	0	17
CONTROLLER	0			
TOM MCCLINTOCK	4	4	0	4
ERNEST F VANCE	1	1	0	1
J CARLOS AGUIRRE	2	2	0	2
STEVE WESTLY	7	6	1	6
LAURA WELLS	2	1	1	1
W/I: Other/Uncertified	0		0	0
OVER VOTE	0		0	0
UNDER VOTE	1		2	3
TOTAL	17	14	4	17
TREASURER	0			
SYLVIA VALENTINE	2	2	0	2
NATHAN E JOHNSON	0	0	0	0
PHIL ANGELIDES	6	7	1	7
GREG CONLON	3	3	0	3
MARIAN SMITHSON	4	4	0	4
JEANNE-MARIE ROSENMEIER	0	0	0	0
W/I: Other/Uncertified	0	0	0	0
OVER VOTE	0		0	0
UNDER VOTE	2		1	1
TOTAL	17	16	2	17
ATTORNEY GENERAL	0			
LEN FREEMAN MOWRER	0	0	0	0
ED KUWATCH	1	2	1	2
DICK ACKERMAN	1	1	0	1
DIANE BEALL TEMPLIN	0	0	0	0
BILL LOCKYER	0	1	1	1
W/I: GEORGE WASHINGTON	13	8	5	8
W/I: Other/Uncertified	0	2	2	2
OVER VOTE	0		0	
UNDER VOTE	2		1	3
TOTAL	17	14	10	17

	VOTER INTENT	RESULT TAPES	ERRORS IN COUNT	BALLOT INSPECT
INSURANCE COMMISSIONER				
GARY MENDOZA	2	2	0	2
JOHN GARAMENDI	5	3	2	3
STEVE KLEIN	2	3	1	3
RAUL CALDERON, JR	2	2	0	2
DALE F OGDEN	2	2	0	2
DAVID I SHEIDLOWER	2	2	0	2
W/I: Other/Uncertified	0		0	0
OVER VOTE	0		0	0
UNDER VOTE	2		1	3
TOTAL	17	14	4	17
BD OF EQUALIZATION DISTRICT 1	0			
CAROL MIGDEN	1	1	0	1
MARK S BENDICK	0	0	0	0
ELIZABETH C BRIERLY	0	0	0	0
W/I: BETSY ROSS	14	9	5	9
W/I: Other/Uncertified	0	3	3	3
OVER VOTE	0		0	
UNDER VOTE	2		2	4
TOTAL	17	13	10	17
US REPRESENTATIVE - DISTRICT 2				
WALLY HERGER	6	6	0	6
CHARLES R. MARTIN	2	2	0	2
MIKE JOHNSON	4	4	0	4
PATRICE THIESSEN	3	3	0	3
W/I: Other/Uncertified	0		0	0
OVER VOTE	0		0	0
UNDER VOTE	2		0	2
TOTAL	17	15	0	17
STATE SENATOR - DISTRICT 4				
MARIANNE SMITH	6	7	1	7
ROBERT H UNDERWOOD	3	3	0	3
SAMUEL AANESTAD	6	5	1	5
W/I: Other/Uncertified	0		0	
OVER VOTE	0		1	1
UNDER VOTE	2		1	1

	VOTER INTENT	RESULT TAPES	ERRORS IN COUNT	BALLOT INSPECT
TOTAL	17	15	4	17
MEMBER ASSEMBLY - DIST 1				
DOUG THRON	0	0	0	0
ROB BROWN	2	2	0	2
PATTY BERG	0	0	0	0
W/I: BENJAMIN FRANKLIN	13	9	4	9
W/I: Other/Uncertified	0	1	1	1
OVER VOTE	0		0	0
UNDER	2		3	5
TOTAL	17	12	8	17
STATE SUPREME COURT				
CARLOS MORENO	0			
YES	8	8	0	8
NO	7	6	1	6
OVER VOTE	0		0	0
UNDER	2		1	3
TOTAL	17	14	2	17
MARVIN R BAXTER				
YES	8	7	1	7
NO	7	6	1	6
OVER VOTE	0		0	0
UNDER	2		2	4
TOTAL	17	13	4	17
KATHRYN M WERDEGAR				
YES	10	9	1	9
NO	5	5	0	5
OVER VOTE	0		0	
UNDER	2		1	3
TOTAL	17	14	2	17
ARTHUR G SCOTLAND				
YES	11	10	1	10
NO	5	5	0	5
OVER	0		1	1
UNDER	1		0	1
TOTAL	17	15	2	17
ROD DAVIS				
YES	8	8	0	8
NO	7	6	1	6

	VOTER INTENT	RESULT TAPES	ERRORS IN COUNT	BALLOT INSPECT
OVER	0		0	
UNDER	2		1	3
TOTAL	17	14	2	17
DANIEL M KOLKEY				
YES	10	9	1	9
NO	5	5	0	5
OVER	0		0	0
UNDER	2		1	3
TOTAL	17	14	2	17
RICHARD SIMS				
YES	6	5	1	5
NO	9	10	1	10
OVER	0		0	
UNDER	2		0	2
TOTAL	17	15	2	17
VANCE W RAYE				
YES	8	8	0	8
NO	7	6	1	6
OVER	0		0	
UNDER	2		1	3
TOTAL	17	14	2	17
RONALD B ROBIE				
YES	10	9	1	9
NO	5	5	0	5
OVER	0		1	1
UNDER	2		0	2
TOTAL	17	14	2	17
SUPERIOR COURT JUDGE				
JAMES WOODWARD	1	1	0	1
JEANETTE PALLA	0	0	0	0
W/I: TOM CRUISE	14	9	5	9
W/I: Other/Uncertified	0	1	1	1
OVER VOTE	0		0	0
UNDER VOTE	2		4	6
TOTAL	17	11	10	17
SUPERINTENDENT OF PUBLIC INSTRUCTION				
JACK O'CONNELL	5	5	0	5
KATHERINE H SMITH	9	8	1	8

	VOTER INTENT	RESULT TAPES	ERRORS IN COUNT	BALLOT INSPECT
W/I: Other/Uncertified	1	1	0	1
OVER VOTE	0		1	1
UNDER VOTE	2		0	2
TOTAL	17	14	2	17
BALLOT MEASURES				
Prop 46- Housing & Emergency...				
YES	13	14	1	14
NO	2	2	0	2
OVER VOTE	0		0	0
UNDER VOTE	2		1	1
TOTAL	17	16	2	17
Prop 47- Kindergarten & University...				
YES	8	7	1	7
NO	7	6	0	7
OVER VOTE	0		0	0
UNDER VOTE	2		1	3
TOTAL	17	13	2	17
Prop 48- Court Consolidation...				
YES	3	3	0	3
NO	12	12	0	12
OVER VOTE	0		0	0
UNDER VOTE	2		0	2
TOTAL		15	0	17
Prop 49- Before & After School...				
YES	2	2	0	2
NO	0	0	0	0
OVER VOTE	0	0	0	0
UNDER VOTE	15		0	15
TOTAL	17	2	0	17
Prop 50- Water Quality, Supply...				
YES	11	10	1	10
NO	4	4	0	4
OVER VOTE	0		0	0
UNDER VOTE	2		1	3
TOTAL	17	14	2	17

	VOTER INTENT	RESULT TAPES	ERRORS IN COUNT	BALLOT INSPECT
Prop 51- Transportation Distrib...				
YES	8	8	0	8
NO	7	5	2	5
OVER VOTE	0		1	1
UNDER VOTE	2		1	3
TOTAL	17	13	4	17

	VOTER INTENT	RESULT TAPES	ERRORS IN COUNT	BALLOT INSPECT
Prop 52- Election Day Voter Regist...				
YES	11	10	1	10
NO	4	4	0	4
OVER VOTE	0		0	
UNDER VOTE	0		3	3
TOTAL	15	14	4	17

Appendix I- Vote-PAD/HART System Error Data by Contest

	VOTER INTENT	RESULT TAPES	ERRORS IN COUNT	BALLOT INSPECT
GOVERNOR				
FRANK A MACALUSO JR	1	1	0	1
PHIL ANGELIDES	6	6	0	6
JERALD ROBERT GERST	0	0	0	0
VIBERT GREENE	0	0	0	0
BARBARA BECNEL	4	3	1	3
JOE BROUILLETTE	0	1	1	1
MICHAEL STRIMLING	0	0	0	0
STEVE WESTLY	2	2	0	2
W/I: Other/Uncertified	1	0	1	0
OVER VOTE	0	0	0	0
UNDER VOTE	0	1	1	1
TOTAL	14	14	4	14
LT GOVERNOR				
LIZ FIGUREROA	2	2	0	2
JACKIE SPEIER	7	7	0	7
JOHN GARAMENDI	4	4	0	4
W/I: Other/Uncertified	1	1	0	1
OVER VOTE	0		0	0
UNDER VOTE	0		0	0
TOTAL	14	14	0	14
SECRETARY OF STATE				
DEBORAH V ORTIZ	12	11	1	11
BOWEN	2	3	1	3
W/I: Other/Uncertified	0	0	0	0
OVER VOTE	0	0	0	0
UNDER VOTE	0	0	0	0
TOTAL	14	14	2	14
CONTROLLER				
JOHN CHIANG	7	7	0	7
JOE DUNN	6	6	0	6
W/I: Other/Uncertified	1	1	0	1
OVER VOTE	0		0	0
UNDER VOTE	0		0	0
TOTAL	14	14	0	14
TREASURER				
BILL LOCKYER	12	12	0	12
W/I: Other/Uncertified	2	1	1	1
OVER VOTE	0		0	0
UNDER VOTE	0	1	1	1

	VOTER INTENT	RESULT TAPES	ERRORS IN COUNT	BALLOT INSPECT
TOTAL	14	14	2	14
ATTORNEY GENERAL				
JERRY BROWN	2	2	0	2
ROCKY DELGADILLO	1	1	0	1
W/I: GEORGE WASHINGTON	11	6	5	6
W/I: Other/Uncertified	0	0	0	0
OVER VOTE	0	1	1	1
UNDER VOTE	0	4	4	4
TOTAL	14	14	10	14
INSURANCE COMMISSIONER				
CRUZ M BUSTAMANTE	7	7	0	7
JOHN KRAFT	6	6	0	6
W/I: Other/Uncertified	1	0	1	0
OVER VOTE	0	0	0	0
UNDER VOTE	0	1	1	1
TOTAL	14	14	2	14
BD OF EQUALIZATION DISTRICT 1				
BETTY T YEE	3	4	1	4
W/I: BETSY ROSS	11	7	4	7
W/I: Other/Uncertified	0	0	0	0
OVER VOTE	0	0	0	0
UNDER VOTE	0	3	3	3
TOTAL	14	14	8	14
US SENATOR				
COLLEEN FERNALD	2	2	0	2
DIANNE FEINSTEIN	9	9	0	9
MARTIN LUTHER CHURCH	3	3	0	3
W/I: Other/Uncertified	0	0	0	0
OVER VOTE	0	0	0	0
UNDER VOTE	0	0	0	0
TOTAL	14	14	0	14
US REPRESENTATIVE - DISTR 1				
MIKE THOMPSON	12	12	0	12
W/I: Other/Uncertified	2	0	0	2
OVER VOTE	0	0	0	0
UNDER VOTE	0	2	0	0
TOTAL	14	14	0	14
MEMBER ASSEMBLY - DISTR 8				

	VOTER INTENT	RESULT TAPES	ERRORS IN COUNT	BALLOT INSPECT
LOIS WOLK	3	3	0	3
W/I: BENJAMIN FRANKLIN	11	5	4	7
W/I: Other/Uncertified	0	0	0	0
OVER VOTE	0	0	0	0
UNDER VOTE	0	6	6	6
TOTAL	14	14	10	16
SUPERINTENDENT OF PUBLIC INSTRUCTION				
SARAH L KNOPP	3	3	0	3
DANIEL L BUNTING	4	4	0	4
GRANT MC MICKEN	1	1	0	1
DIANE A LENNING	0	0	0	0
JACK O'CONNELL	6	6	0	6
W/I: Other/Uncertified	0	0	0	0
OVER VOTE	0	0	0	0
UNDER VOTE	0	0	0	0
TOTAL	14	14	0	14
COUNTY SUPERINTENDENT OF SCHOOLS				
JORGE O AYALA	13	12	1	12
W/I: Other/Uncertified	1	0	1	0
OVER VOTE	0	0	0	0
UNDER VOTE	0	2	2	2
TOTAL	14	14	4	14
SUPERVISOR – DISTRICT 3				
BRENDA ELAINE CEDARBLADE	2	2	0	2
MATT REXROAD	6	6	0	6
FRANK SIEFERMAN, JR	6	6	0	6
W/I: Other/Uncertified	0	0	0	0
OVER VOTE	0	0	0	0
UNDER VOTE	0	0	0	0
TOTAL	14	14	0	14
ASSESSOR				
JOEL BUTLER	8	8	0	8
BOB MILBRODT	6	6	0	6
W/I: Other/Uncertified	0	0	0	0
OVER VOTE	0	0	0	0
UNDER VOTE	0	0	0	0
TOTAL	14	14	0	14
AUDITOR-CONTROLLER /TREASURER TAX COLLECTOR				
HOWARD NEWENS	2	2	0	2
W/I: TOM CRUISE	12	5	7	5

	VOTER INTENT	RESULT TAPES	ERRORS IN COUNT	BALLOT INSPECT
W/I: Other/Uncertified	0	0	0	0
OVER VOTE	0	0	0	0
UNDER VOTE	0	7	7	7
TOTAL	14	14	14	14
COUNTY CLERK/RECORDER				
FREDDIE OAKLEY	11	11	0	11
W/I: Other/Uncertified	2	1	1	1
OVER VOTE	0	0	0	0
UNDER VOTE	1	2	1	2
TOTAL	14	14	2	14
DISTRICT ATTORNEY				
PATRICIA RAE LENZI	7	7	0	7
JEFF REISIG	7	7	0	7
W/I: Other/Uncertified	0	0	0	0
OVER VOTE	0	0	0	0
UNDER VOTE	0	0	0	0
TOTAL	14	14	0	14
PUBLIC GUARDIAN/ADMINISTR				
CASS SYLVIA	13	12	1	12
W/I: Other/Uncertified	1	0	1	0
OVER VOTE	0	0	0	0
UNDER VOTE	0	2	2	2
TOTAL	14	14	4	14
SHERIFF-CORONER				
ED PRIETO	13	13	0	13
W/I: Other/Uncertified	1	1	0	1
OVER VOTE	0	0	0	0
UNDER VOTE	0	0	0	0
TOTAL	14	14	0	14
WOODLAND CITY COUNCIL				
<i>(Vote for two)</i>				
MARLIN H "SKIP" DAVIES	3	3	0	3
DAN RYHAL	5	5	0	5
XAVIER C TAFOYA	3	3	0	3
BILL MARBLE	7	7	0	7
W/I: Other/Uncertified	3	3	0	3
OVER VOTE	0	0	0	0
UNDER VOTE	7	7	0	7
TOTAL	28	28	0	28
BALLOT MEASURES				
Prop 81- California Reading & ...				
YES	11	10	1	10
NO	3	3	0	3

	VOTER INTENT	RESULT TAPES	ERRORS IN COUNT	BALLOT INSPECT
OVER VOTE	0	0	0	0
UNDER VOTE	0	1	1	1
TOTAL	14	14	2	14
<i>Prop 82- Court Consolidation...</i>				
YES	1	1	0	1
NO	13	10	3	10
OVER	0	1	1	1
UNDER	0	2	2	2
TOTAL	14	14	6	14
<i>Woodland – Measure A</i>				
YES	0	2	2	2
NO	1	2	1	2
OVER	0	0	0	0
UNDER	13	10	3	10
TOTAL	14	14	6	14
<i>Woodland – Measure B</i>				
YES	7	7	0	7
NO	7	7	0	7
OVER	0	0	0	0

	VOTER INTENT	RESULT TAPES	ERRORS IN COUNT	BALLOT INSPECT
UNDER	0	0	0	0
TOTAL	14	14	0	14
<i>Woodland – Measure C</i>				
YES	10	11	1	11
NO	4	3	1	3
OVER	0	0	0	0
UNDER	0	0	0	0
TOTAL	14	14	2	14
<i>Woodland – Measure D</i>				
YES	8	8	0	8
NO	6	6	0	6
OVER	0	0	0	0
UNDER	0	0	0	0
TOTAL	14	14	0	14
<i>Woodland – Measure E</i>				
YES	9	9	0	9
NO	5	5	0	5
OVER	0	0	0	0
UNDER	0	0	0	0
TOTAL	14	14	0	14

Appendix I- Verification Error Data by System

Vote-PAD/DESI System

	ALL CONTESTS			OVERVOTES		UNDERVOTES		WRITE-INS	
Voter #	Correct	Contests	Error %	Correct	Total	Correct	Total	Correct	Total
104	22	29	24.1%	0	1	1	1	0	2
114	22	29	24.1%	0	1	1	1	0	2
201	25	29	13.8%	0	1	1	1	0	2
205	11	14	21.4%	1	1	1	1	0	2
208	27	29	6.9%	1	1	1	1	0	2
Totals	107	130	17.7%	2	5	5	5	0	10
Error Rate				60.0%		0.0%		100.0%	

Vote-PAD/Hart System

	ALL CONTESTS			OVERVOTES		UNDERVOTES		WRITE-INS	
Voter #	Correct	Contests	Error %	Correct	Total	Correct	Total	Correct	Total
108	23	28	17.9%	0	0	1	1	0	2
116	23	28	17.9%	0	0	0	1	0	2
202	25	28	10.7%	0	0	1	1	0	2
210	25	28	10.7%	0	1	2	2	0	2
Totals	96	112	14.3%	0	1	4	5	0	8
Error Rate				100.0%		20.0%		100.0%	